"Witness the Plesiosaurus": Geological Traces and the Loch Ness Monster Narrative

Katja Jylkka
University of California, Davis

ABSTRACT: Discussions of the Loch Ness Monster, and indeed cryptozoology, the search for unknown animals in general, tend to be oriented around questions of authenticity, scientific rigor, and biological truth. This essay argues that, by considering perspectives from the history of science and literary study, we can see the image of a dinosaur survival in Loch Ness as a powerful narrative that exists in both works of fiction and sightings of the monster. The essay tracks the parallels between descriptions of Loch Ness's famous creature and figures from texts such as Bram Stoker's *The Lair of the White Worm*.

One summer afternoon in 1933, George Spicer and his wife were visiting Inverness, Scotland and driving along the road that skirts the shore of Loch Ness. Suddenly, they noticed something strange on the road ahead of them. The *Inverness Courier* published the letter that Spicer later wrote regarding the incident. "I saw the nearest approach to a dragon or a prehistoric animal that I have ever seen in my life," Spicer recalled. "It crossed my road about fifty yards ahead and appeared to be carrying a small lamb or animal of some kind. It seemed to have a long neck which moved up and down, in the manner of a scenic railway, and the body was fairly big, with a high back."[1] In the months preceding this encounter, sightings of what was supposedly an unidentified creature in the Loch had been increasing at a feverish pitch. Even today, many decades later, the

1. Daniel Loxton and Donald Prothero, *Abominable Science! Origins of the Yeti, Nessie, and Other Cryptids* (New York: Columbia University Press, 2012), p. 130.

Configurations, 2018, 26:207–234 © 2018 by Johns Hopkins University Press and the Society for Literature, Science, and the Arts.

Spicers' clear, daytime, sensational account offers a sort of *ne plus ultra* of sightings for many enthusiasts of the "Loch Ness monster," or "Nessie," as the creature is now often called.

In what follows, I trace a genealogy of the figure of the Loch Ness monster to a longer history of sea serpent sightings and across a variety of media and written forms. What I will refer to as the "Loch Ness monster narrative" refers not only to the idea that there is a mysterious creature in the lake, but specifically to the exceedingly popular and persistent belief that the creature in Loch Ness is a descendant of an aquatic contemporary of the dinosaur. In others words, there are many narratives about a creature living in Loch Ness, some of which I at least allude to in what follows, but my primary focus is the story of Nessie as a *Plesiosaurus* or a descendant of the plesiosaur family. This specific narrative begins in the early 1930s, when an explosion of Nessie sightings hit Scottish and English newspapers. However, this twentieth-century phenomenon draws on narratives (both fictional and scientific) of the nineteenth century and most heavily on the reconstruction of the mythic sea serpent as an object of scientific knowledge. I argue that tracing this genealogy allows for the modern adherence to the Nessie-as-plesiosaur narrative in the cryptozoological community and in the popular imagination to be seen not as an example of extra-scientific lunacy, but rather as a quite natural extension of scientific questions and practices arising in the nineteenth century, particularly regarding the idea of sea serpents. In other words, by setting aside the question of biological existence—is there something unknown in the Loch or not?—and adopting the lens of cultural and literary inquiry, we can gain a new set of fruitful questions. Why did people start telling stories about a creature that lived in Loch Ness? And how did contemporary scientific discoveries shape those stories?

The idea of dinosaurs surviving to coexist with man, a scientific possibility produced by geological discoveries made in the nineteenth century, elicited a variety of emotions and questions, such as whether the survival of dinosaurs should be classified as a "natural" or "supernatural" possibility and whether man or dinosaur would win the day in a contest for survival.[2] The archive necessary to show

2. Although plesiosaurs are not dinosaurs in a taxonomic sense, this essay will often consider them to be part of the same cultural category. In this decision, I am in keeping with late Victorian discourse, as explained by Ralph O'Connor, "Victorian Saurians: The Linguistic Prehistory of the Modern Dinosaur," *Journal of Victorian Culture* 17:4 (December 2012): 492–504, at 494–495: "For many people then, as now, the anatomical features which distinguish dinosaurs from other ancient reptiles were less meaningful—and therefore less in need of a label—than the characteristics and associations

the connection between the modern narrative of Nessie-as-plesiosaur and much older speculation about dinosaurs and sea serpents ranges from scientific texts of the nineteenth and twentieth centuries, newspaper articles and letters to works of fiction. In differing genres and modes, these texts show how scientists and nonscientists speculated about contemporaneous scientific possibilities. By examining narratives told about the Loch Ness monster alongside fictional narratives of dinosaur survival, we can both expand the archive of texts that imagine the coexistence of man and dinosaur to include cryptozoological ones and learn more about the processes of scientific discovery, particularly the ways in which nonspecialists interact with scientific possibilities.

The Nessie narrative, like the sea serpent stories that preceded it, gains its form from changes in three areas of scientific culture. The beginning and middle of the nineteenth century had seen the creation of a nonspecialist, middle-class audience for scientific ideas through new publications, public lectures, and overall, a novel commitment to public education.[3] Yet, as Roger Luckhurst writes in *The Invention of Telepathy*, the last decades of the nineteenth century saw "the shift of scientific study from a small, if influential, pursuit of gentleman-amateurs into an institutional *system*, highly differentiated, government funded, integrated with compulsory education, and with powerful professional spokesmen asserting the primacy of scientific authority over traditional orientations of experience."[4] The Nessie narrative, I argue, takes some of its form from this shift in the configuration of scientific authority at the turn of the century from a more democratic, less specialized set of fields to a professional system.[5] The general public's purchase and authority on certain sci-

which all these creatures were commonly felt to share (such as being frightening, large, scaly, fierce and extremely ancient)."

3. Much has been written on this topic, but of particular relevance to this project are the following. For more on book-length scientific works from the nineteenth century meant to be read by a wide, nonspecialist audience, see James Secord, *Visions of Science: Books and Readers at the Dawn of the Victorian Age* (Chicago: The University of Chicago Press, 2015). Gowan Dawson, *Show Me the Bone: Reconstructing Prehistoric Monsters in Nineteenth-Century Britain and America* (Chicago: The University of Chicago Press, 2016), specifically examines the mobility and transformations of paleontological knowledge in the nineteenth century.

4. Roger Luckhurst, *The Invention of Telepathy, 1870–1901* (New York: Oxford University Press, 2002), p. 9.

5. For more on this set of changes in scientific culture and communication, see Jan Golinski, "The Literature of the New Sciences," in *The Cambridge History of English Romantic Literature*, ed. James Chandler (Cambridge: Cambridge University Press, 2009), pp. 527–552.

entific issues was rendered ambiguous by this movement toward specialization and professionalization, as will be explored in more detail later in this essay.

The second set of scientific practices shaping the Nessie narrative arises from the distinction between laboratory and field sciences in the latter half of the nineteenth century, on both sides of the Atlantic. "The field sciences in Victorian England and the United States depended heavily on trust," Stuart McCook writes. "In the laboratory, all experiments are at least in principle independent of time and space. Doubts can be resolved by repeating the experiment. In contrast, the field sciences depend heavily on time and space. Replicability, particularly in the nineteenth-century field sciences, was difficult, if not impossible. Accordingly, the field scientists depended much more heavily on authority than did the laboratory sciences."[6] Thus, the questions of scientific authority I highlight above take on an even greater importance and greater ambiguity in the field sciences, where experts cannot always be in the field and those in the field are not always considered "experts."

McCook's account of Paul du Chaillu's troubled career as a field collector in the 1860s and 1870s illustrates many of the complicated qualities that supposedly constituted a "good," reliable scientific observer: "respecting the intellectual territory of other scientists by not making claims in their area of expertise, being of the right race, and not being too blatantly commercial and publicity-seeking."[7] The ways in which field sciences trouble the already tenuous establishment of scientific authority in the late nineteenth century creates a space in which the Nessie narrative can be posited and each sighting, each observer can be held to slightly different standards of scientific expertise. The questions of a Nessie observer's race, class, scientific knowledge, education, intentions, and ability to recognize *known* species of animal arise again and again in the narrative's history (and, indeed, similar questions arise throughout the modern field of cryptozoology). But, unlike du Chaillu, many of these observers were not professional scientists in any sense, often asking scientists and the public to take their claims of scientific knowledge or lack of bias at face value.

Lastly, Nessie's narrative form is also indebted to the practices and beliefs of the field of geology and changes therein. Geology, although technically dedicated to the study of the Earth's physical,

6. Stuart McCook, "'It May Be Truth, but It Is Not Evidence': Paul du Chaillu and the Legitimation of Evidence in the Field Sciences," *Osiris* 11:1 (1996): 177–197, at p. 196.

7. McCook, "It May Be Truth" (above, n. 6), p. 190.

nonorganic features, also involved the study of fossilization and ancient forms of life, especially in the nineteenth century, when paleontology was a less distinct field.[8] As a field that was born and developed in the nineteenth century, geology's growing pains lent certain questions and debates to the Nessie story. Debates about the age of the Earth, how to interpret the significance of that age, and the nature of fossils all opened up space for disagreement about the possibility of dinosaurs' survival, as well as the possibility that the existence of modern dinosaur relatives could explain centuries of sightings of giant, strange creatures in oceans and other large bodies of water. The idea of "persistence," the survival of ancient species deemed "living fossils," was both contested and deployed as evidence for the survival of the charismatic megafauna of prehistory.[9] These debates found purchase in the narratives of sea serpents in the nineteenth century, in part because of the question of what constituted valid evidence for this field of science. Thus, the changes in the relationship between scientific experts and a less specialized public, the ambiguities introduced by science in the field as opposed to in the laboratory, and factions within the field of geology itself all introduced uncertainty in the production of scientific knowledge. This production of knowledge was also shaped by the changing forms of writing practiced by geologists.

Geology, in the first couple of centuries of its existence as a field, had a conflicted relationship with imaginative writing. Depending on pressures both internal and external to the field, geology was at times more and at times less willing to accommodate greater imaginative license in its publications and writings. Before the nineteenth century, the term "geology" was more synonymous with "cosmology," as represented by works such as Thomas Burnet's *Sacred Theory*

8. See Ralph O'Connor, *The Earth on Show: Fossils and the Poetics of Popular Science 1802–1856* (Chicago: The University of Chicago Press, 2008). As O'Connor observes, geology and paleontology were recognized as officially distinct fields as early as the 1820s. However, for much of the nineteenth century, the term "geology" was often used to refer to the Earth's physical structure and processes as well as the fossilized life found within that structure, and even, by extension, the behavior and biology of that life. I, like O'Connor, will largely use the term "geology" in this older, more expansive sense and will use the term "paleontology" when relevant or referring to more recent science.

9. For more on the relationship between Darwinian evolution and persistence, see Adrian Desmond, *Archetypes and Ancestors: Palaeontology in Victorian London, 1850–1875* (Chicago: The University of Chicago Press, 1984). Victorian scientist Thomas Huxley's paper "On the Persistent Types of Animal Life," in *The Scientific Memoirs of Thomas Henry Huxley*, ed. Michael Foster and E. Ray Lankester (London: Macmillan, 1902), vol. 2, pp. 90–93, articulates his belief in the role of persistence in evolution.

of the Earth (1684). The texts of this earlier scientific genre embraced the use of literary discourse in illustrating concepts to their audiences, a seemingly natural fit since these concepts were often quite exciting to the layperson (Noah's flood, the theory of the hollow Earth, etc.). In the early 1800s, geology moved away from such theories and toward a more empirical approach to the Earth's strata and processes, with an attendant shift away from "literariness" in the field's writing. Later in the nineteenth century, however, geology found itself trying to court public attention, both for the purposes of general education and for gathering prestige and funding. Thus, as Ralph O'Connor notes, "geology had to avoid the opposite taint of being boring" and used publicly accessible texts to attract interest and monetary support.[10] As the nineteenth century drew to a close, imaginative discourse was once again on the wane in the geological community (and, indeed, in scientific communication as a whole) as scientists attempted to separate out scientific "facts" from "the words communicating them," the aesthetics of the scientific text.[11]

For portions of geology's history, its practitioners relied upon imaginative speculation and the sort of colorful verbal imagery modern readers would associate solely with fictional writing in order to communicate complicated concepts to nonspecialist readers. However, at other times, geologists attempted to distance themselves from accusations of amateurism or a lack of empiricism by staunchly refusing to engage in anything that looked like imaginative representation, speculation, or "poetry."[12] To make matters more complicated, later readers may not have known about this history of geology's relationship to writing. The problem of taking in outdated scientific information without the benefits of expert guidance and institutional context recalls the protagonist of Mary Shelley's *Frankenstein*, whose independent studies brought him, disastrously, into encounters with "exploded" sciences.[13] Some of the twentieth-century proponents of the plesiosaur theory, for instance, were readers attracted to the style of imaginative geological writing, but who failed to take into account the progress of the field over the course of the nineteenth century.

The slowness and unevenness of these transitions within geology, the pendulum swinging gradually between imaginative license and

10. O'Connor, *The Earth on Show* (above, n. 8), p. 18.

11. Ibid., p. 242.

12. For more on this complicated and vacillating history, see O'Connor's *The Earth on Show* (above, n. 8).

13. Mary Shelley, *Frankenstein (London: Penguin Classics, 1992), p. 40.*

the dream of pure objectivity, provides part of the context for the narratives I study here—the narratives surrounding the Loch Ness monster, sea serpents more broadly, and many works of fiction that also posit the survival of extinct, prehistoric species. The nineteenth-century scientific and cultural context I have sketched here influenced the production of the sea serpent as a scientifically recognizable figure, a narrative that later permeated discussions of the Loch Ness monster in the early twentieth century. The production of figures very similar to the saurian sea serpent and Loch Ness monster in works of fiction, such as the dinosaurs of Sir Arthur Conan Doyle's *The Lost World* and the prehistoric, preternatural white worm in Bram Stoker's *The Lair of the White Worm*, demonstrates that the layers of context and influence I have mapped out here were not confined to one isolated scientific community, but instead were pervasive scientific-cultural formations. If what constitutes scientific "fact" in the latter half of the nineteenth century is unstable, if who can be deemed an "expert" on those facts is uncertain, and the very bounds of the laws of nature are also up for debate, this combination creates a situation in which imagination offers up new scientific possibilities, and those possibilities cannot be easily falsified. In what follows, I will show how the growing fields of geology and paleontology created space for a vision of the world in which some dinosaurs or dinosaur contemporaries lived on, specifically as sea serpents. The popular sea-serpent-as-plesiosaur theory of the nineteenth century and a fertile cultural ground in the Scottish highlands allowed that narrative to survive, ready to be applied to the Loch Ness monster decades later in the 1930s.

The sea serpent, already extant in cultures around the world as a creature of myth, found a ready fit in a shape offered by geological discovery. Increased understanding of dinosaurs and their fossils also came at a time when the sciences as a whole were transforming into a set of specialized professions. Lack of consensus in the nineteenth century on what constituted a scientific "expert" and what could be reliable, scientific evidence of sea serpents allowed for belief in the creatures to persist. In the early twentieth century, due in part to stasis in the field of geology, that persistence found purchase in Loch Ness. A confluence of cultural and scientific factors allowed the idea of something supernatural living in the Loch to easily take on the shape of the preexisting sea serpent.

"Monster" Sightings

Typing the words "Loch Ness monster" into a Google image search will yield roughly two categories of results: famous photographs that

supposedly show the mythic creature and artists' renderings of the creature, originally produced either as static illustrations or for various films. The former group frequently contains pictures such as the (in)famous "Surgeon's photograph" (taken in 1934 by Colonel Robert Wilson), a black and white image that appears to show the long, slender neck and small head of a creature rising from the water's surface, or the 1933 Hugh Gray photograph, which shows a sinuous shape partially submerged in the waters of the lake. Artists' imaginings of the Loch Ness monster play a role in movies such as *The Private Life of Sherlock Holmes* (1970) and more recent computer-generated interpretations. These last, almost without exception, have long, sinuous necks ending in small, blunt heads and thick bodies with four seal-like flippers and a long tail. This is all to say that, for an animal whose existence has not been proven, depictions of the creature are remarkably coherent in taking the shape of a *Plesiosaurus dolichodeirus*. The plesiosaur is an order of large reptiles that lived in the Jurassic period, which meant that it shared the planet (and is often conflated) with dinosaurs.

There is no scientific consensus as to whether any sort of unknown creature inhabits Loch Ness, and theories to explain strange sightings in the lake range widely—from geological shifts creating disturbances in the lake's surface, to unusual boat wakes, to the paranormal, to swans, to giant catfish, to large seal relatives, to plesiosaurs. Many, on the other hand, maintain that nothing unusual exists in the Loch.[14] Despite all this uncertainty, the popular imagination forms the Loch Ness monster in the shape of a *Plesiosaurus* over and over again, as evidenced by a Google search, a look at children's books, or an examination of movies, including documentaries attempting to puzzle out the myth. Even books that advance other theories about the creature, such as Nick Redfern's *Nessie: Exploring the Supernatural Origins of the Loch Ness Monster* (2016), feel compelled to acknowledge and refute the plesiosaur theory before moving on to their own arguments. Redfern, for instance, states near the

14. Loren Coleman, often considered an expert in the field of cryptozoology, synthesizes the state of Loch Ness monster discourse in his *Field Guide to Lake Monsters, Sea Serpents, and Other Denizens of the Deep* (New York: Jeremy P. Tarcher, 2003). As Coleman writes, "No one actually argues that Sea Serpent and Lake Monster witnesses are not seeing anything. The argument is over just *what* they are seeing. And there is no doubt that what *most* people are seeing are *not* Sea Serpents or Lake Monsters but (take a breath, this list is a long one) such things as boats, waves, fish feeding close to the surface, tricks of light on the water, fish swimming in densely packed formations, waterspouts and water devils, currents uprooting debris from the bottom, Indian dugouts bubbling to the surface, masses of floating seaweed, birds skimming the water, prototype navy submarines, and dead trees" (p. 26).

beginning of his book, "There's no doubt that this [the plesiosaur theory] is the most popular and engaging theory for the Nessies, and one which the Scottish tourist industry, Hollywood, and the media love to promote whenever possible."[15] The liveliness and persistence of this theory, in the face of no certain evidence, lies at the heart of my inquiry here. The biological and scientific uncertainty of the creature contrasts with the powerful attraction and staying power of the plesiosaur hypothesis.

By the 1930s, reports of a monster in the Loch were being published in local Inverness newspapers every month, often multiple times a month. These articles range from the briefest of bulletins, reporting on where the monster had most recently been seen and by whom, to elaborate defenses of various theories regarding the creature's identity.[16] In examining the language and narrative form of these articles, one can see some of the scientific and cultural questions affecting the Loch Ness monster narrative. These questions of narrative and form also help to illuminate the connections between the Loch Ness monster narrative of the 1930s with the theories of saurian sea serpents in the later nineteenth century. Some patterns in these articles are, consequently, worth noting here, many of which occur in one article from October of 1933, which follows in its entirety:

> To the Editor of the Inverness Courier. The Brown House, Warwick-on-Eden. Cumberland, Oct. 8th. Sir, - I am greatly interested in your articles in the "Courier," dated September 26th, re the "Monster" of Loch Ness. I know the loch well, my father having had the shootings at Dores some years ago. Surely from a scientific point of view something should be done; is there nobody who would interest themselves in the matter? I was once told by a most learned man that many of these Scottish lochs must be full of weird, unknown fish and animals, that live undisturbed for years and years in their depths. I

15. Nick Redfern, *Nessie: Exploring the Supernatural Origins of the Loch Ness Monster* (Woodbury: Llewellyn Publications, 2016), p. 65.

16. The *Inverness Courier*, based in Inverness, Scotland, published many of these articles. See, for example, D. J. Munro, "Loch Ness 'Monster,'" *Inverness Courier*, January 16, 1934. Written by a sea captain who offers his own theory (that the creature is a seal), the article asserts, "As a mariner of very many years' experience in all the oceans of the world, I am naturally very sceptical of accounts given by those not accustomed to the sea of what they sometimes see in or on the water." The *Scotsman* and the *Edinburgh Evening News*, both based in Edinburgh, also published a number of pieces on the creature in the 1930s. Some of the discussion of the creature was meant to make light of the cultural phenomenon. See H. M. Cadell, "An Odious Ode to the Loch Ness Monster," *Scotsman*, January 4, 1934. The first lines of the poem read "O Loch Ness Monster, who are you? / No kith or kin in any zoo. / Some prehistoric creature grim?"

> am told Loch Ness is almost bottomless in places, and that nobody who is drowned in its waters is ever found. I have ordered a copy of your paper every week from my newsagents in Carlisle, as I am so greatly interested in the subject. - Yours etc., E. Mostyn Walker.[17]

Walker's letter shares a number of similarities with other pieces on the monster, both published letters and articles, indicating the presence of a set of forms that the Nessie narrative takes. For instance, Walker's letter refers to the creature as a "monster," but only in quotation marks. This habit is one that is shared by many newspaper editors as well. In an article published in the *Inverness Courier* on June 9, 1933, for example, the headline refers to the "Loch Ness 'Monster.'"[18] This judicious use of quotation marks indicates the Nessie narrative's position at the shifting boundary line between "natural" and "supernatural." The creature's unknown biological category makes the term "monster" both a useful and usefully sensational label. Yet widely read and respectable newspapers such as the *Inverness Courier* and the *Scotsman* cannot quite bring themselves to leave the term unannotated; using quotation marks allows the paper to allude to the creature's supernatural potential, while also maintaining an adherence to natural explanations and scientific empiricism.

Another characteristic of these articles, including Walker's, is the number of them that are either composed of or refer to letters written to the newspapers by their readers. An article in the *Inverness Courier* in October of 1933, for instance, features what it describes as "two interesting letters with reference to the appearances of the Loch Ness 'monster,'" both reproduced in full.[19] Other missives are anonymous, the newspaper editors only disclosing that a theory was suggested to them by "a lady correspondent," for example.[20] These published letters offer valuable insight into the ideas of nonscientists, nonspecialists, about not only the mystery in Loch Ness, but about their engagement with scientific discoveries more generally. E. Mostyn Walker, for example, begins his letter with a claim to a sort of ownership and expertise over the Loch ("I know the loch well, my father having had the shootings at Dores some years ago"), a claim that makes no statements about the writer's scientific knowledge, but seems to assert the equal importance of local, experien-

17. "Correspondence: The Loch Ness Monster," *Inverness Courier*, October 13, 1933.

18. "Loch Ness 'Monster,'" *Inverness Courier*, June 9, 1933.

19. "Loch Ness 'Monster'—Problem for Scientific Society," *Inverness Courier*, October 10 1933.

20. "Loch Ness Monster Theory," *Inverness Courier*, September 5, 1933.

tial knowledge. Walker's assertion helps to show how the Loch Ness monster narrative is indebted to the destabilizing of geological expertise inherited from the later Victorian period. Professors and other scientific experts have their letters published regarding the creature, but those of "experts" in other fields—such as sea captains—are published as well. The editorial practice of not only publishing letters, but also publishing chains of letters in which correspondents wrote to the newspaper's editorial staff as well as to each other, allowed even average readers to weigh in on the question of Nessie's existence and even contest the judgments of scientists.

In their letter to the *Courier*, Walker writes, "Surely from a scientific point of view something should be done," yet they also assert that "weird, unknown" creatures live in the lake and have remained hidden to science because it is "almost bottomless." Many of the letters and articles concerning the Nessie excitement of the 1930s share in this ambivalence between the promise of science to uncover the truth behind the phenomenon at Loch Ness and an embrace of the ultimate unknowability of the natural world.

The lack of hard evidence such as a very clear photograph or a body of the Loch Ness monster throughout this explosion of public interest did not deter many believers. Heated arguments about the identity of the creature were still regularly published in newspapers such as the *Scotsman* and the *Illustrated London News* throughout the 1950s, 1960s, and 1970s.[21] What is striking about these later discussions of the monster is just how similar they are to the ones decades earlier. That is, scientists and laymen continue to rehash the same arguments and even the same *ways of* arguing about the creature: the possibility of a prehistoric survival, the impossibility of said prehistoric survival, the reliability of witness testimony as scientific evidence, the inadmissibility of eyewitness reports as evidence, the still unknown depths and geographies of the bottom of Loch Ness, the very known, very recorded depths and geographies of the Loch, and so on. Part of this trend seems to have its origins in the tumultuous scientific time in which the idea of saurian survival began to emerge, a time when the very boundaries of the fields of geology and paleontology were still mutable and the line between professional and amateur scientist, particularly in those fields, was not yet solid. As explored earlier in this essay, a layman or self-educated expert might write to a newspaper and contest the conclusions of a paleontologist

21. See, for instance, Maurice Burton, "Monsters: In Fact and (?) Fiction," *Illustrated London News*, June 15, 1957; "Theories on the Loch Ness Monster," *Scotsman*, November 4, 1949; "A Scotsman's Log," *Scotsman*, September 22, 1950.

in ways that were not as plausible in the fields of chemistry or physics, both due to the history of the field of paleontology and to the difference between an observational, field science and a laboratory science.

The ability for scientific discussions to be carried out and printed in newspapers simultaneously opened up access to scholarly conversations and revealed inequalities of access to scientific information and resources. A letter by a "P. A. S." printed in the *Scotsman* in October of 1950, for instance, includes the following: "By the way, is it agreed that the plesiosaur was not a fresh-water animal? According to the scientist who wrote the article on plesiosaurs in the *Encyclopedia Britannica*, plesiosaur remains have been found in both fresh water and salt water deposits."[22] Although the article does not mention which edition of *Encyclopedia Britannica* is referenced here, the date of the letter would initially seem to make the fourteenth edition likely, which was published from 1929 until 1974. However, the entry for "plesiosaur" in the fourteenth edition is quite short and makes no mention of the location of fossil plesiosaurs. The entry for "Plesiosaurians" in the ninth edition, published from 1875 until 1902, however, does mention the discovery of *Plesiosaurus* fossils at the mouths of rivers and, indeed, begins with the sentence, "The remarkable extinct marine reptiles included in the group of the Plesiosauria (or Sauropterygia, as they are sometimes called) existed during the whole of the Mesozoic period, that is, from Triassic into Cretaceous times, when they *appear* to have died out."[23] The author of the letter published in the *Scotsman*, then, was very likely using an edition of the *Encyclopaedia* that was at least fifty years old and published in a time when Mesozoic survivals seemed more possible. Although the *Britannica*'s editorial staff sourced its articles from experts in various fields, the letter writer's lack of references to more exclusive or professional scientific journals where more up-to-date information from the fields of geology and paleontology would have been published indicates a way in which different genres of scientific writing in this period worked to demarcate the scientists and the laymen. The difficulty of agreeing on a species' biology and behavior from fossils has long plagued the fields of paleontology and the study of prehistoric life, and that difficulty has led to some questions remaining unresolved for a very long time. Unanswered questions such as whether plesiosaurs spent any time on land or whether they

22. "Points of View: Loch Ness Monster," *Scotsman*, October 26, 1950.

23. "Plesiosaurians," *Encyclopaedia Britannica*, 9th ed. (London: A & C Black, 1902) (emphasis added). The eleventh edition has no entry for plesiosaurs at all.

could have lived in fresh- and saltwater have offered ample fodder for unresolvable debates about the Loch Ness monster's identity.

Misunderstandings and ambiguity surrounding the history of geology and the "shelf life" of scientific theories are, as clear from the above, one of the ways in which the Nessie-as-plesiosaur theory has gained and kept traction. Rupert Gould, a British naval officer with interests in both horology and sea serpents, authored one of the first full-length books devoted exclusively to theories of the Loch Ness monster in 1934. In the following newspaper piece, Gould eats some crow regarding his debate with a geologist in the *Times Literary Supplement*:

> While dealing with this subject—the possible survival of some form of plesiosaurus, and its bearing upon the various reports of "sea-serpents"—I should like to take the opportunity of amplifying and qualifying what I said about it in my former book. Some readers of the *Times Literary Supplement* may remember that my remarks gave rise to a correspondence in its columns between the late Dr. F. A. Bather and myself; and I should like to record the salient features of the controversy.
>
> Dr. Bather pointed out that "the fossil remains of Plesiosauridae are not uncommon throughout the Mesozoic or Secondary rocks," but that "the fossil faunas of the Tertiary and Quaternary Eras, though rich enough in the bones of marine vertebrates, have not yielded a single fragment of a plesiosaurus"; and he concluded that ". . . until one has been found, the supposition that any representative of the family exists to-day is scarcely admissible."
>
> In reply, I pointed out that the "sea-serpent," even if not a direct descendant of the plesiosaurus, might still have evolved along similar lines to it; and I cited, on the authority of Philip Gosse, three instances (the iguana, the long-necked river-tortoise and the *Chimera*) of living creatures whose ancestral types were to be found in the Secondary strata, but were absent from the Tertiary and Quaternary.
>
> Being a casual reader attracted by Gosse's style, and not a serious student of geology, I had overlooked the fact that he wrote in 1860, and that palaeontology is a progressive science. Dr. Bather courteously indicated that I was a little behind the times; and that Tertiary and Quaternary fossils of all three creatures had been found in many places.[24]

Like many Nessie adherents who would come after him, Gould's ideas and evidence are, in an interestingly literal way, "behind the times." Gosse's book *The Romance of Natural History* was written over seventy years before Gould's and was indeed based on a much earlier understanding of geological processes and paleontology. While

24. R. T. Gould, *The Loch Ness Monster* (Secaucus, NJ: Citadel Press, 1969), pp. 121–122.

Gould's misunderstanding only brought him an awkwardly public professional encounter, similar consumption of incomplete or obsolete information continues to feed the survival of the Nessie narrative.

Evidence of the Loch Ness monster never reaches the standards of mainstream science, thus never definitively proving the creature's existence. But that also means that the evidence can never be definitively falsified in the cryptozoological discourse community either, since it has inherited ambiguous definitions of expertise and evidence from its disciplinary history.[25] Consequently, the same images and the same stories circulate for years. Even proven hoaxes, such as the "Surgeon's photograph" mentioned at the beginning of this section, continue to serve as illustrations in articles and books on the creature.[26] While it is acknowledged as a hoax, the image is often still present as a visual shorthand for the Nessie narrative, reinforcing that particular shape.[27] From the various cryptozoological texts discussed above, it is clear that there are certain ways of talking about the Loch Ness monster that constitute narrative conventions, and that those conventions have their roots in the context of late nineteenth-century geology, but why specifically dinosaurs? And why specifically Loch Ness?

Creatures Out of Time

The idea that the Loch Ness monster's saurian shape is more culturally than biologically derived has been suggested before. *Abominable Science! Origins of the Yeti, Nessie, and Other Cryptids*, by Loxton and Prothero, already makes the argument that sightings of the Loch Ness monster can be traced to the proliferation of images of the dinosaur in the 1930s, specifically to the popularity of the film *King*

25. Karl Popper famously proposed his solution to the "demarcation problem," that is, how to tell the difference between a "science" and a "pseudoscience," as being that the former is falsifiable and the latter is not. While the purpose of this project is not to test out applications and weaknesses in Popper's falsifiability argument on figures from cryptozoology, the idea of falsifiability has relevance here and may help to explain part of the reasoning for the Nessie narrative's longevity.

26. A number of sources either implicitly or explicitly acknowledge the emblematic power of the Surgeon's photograph. For instance, see Katie Boyd and Beckah Boyd, *Ghosts of New Hampshire's Lake Region* (Charleston, SC: The History Press, 2010). As the Boyds write, "Well, it likely was an accidental fake or, rather, a misunderstood sighting. Many of the Nessie photos captured at the loch are just that, but the Surgeon's Photograph stands as the iconic image of Loch Ness" (p. 38).

27. And, indeed, some contributors to Nessie-oriented websites even refute the hoaxer's confession, arguing that the explanation of the hoax is, itself, a hoax. See Richard D. Smith, "The Classic Wilson Nessie Photo: Is the Hoax a Hoax?," *Fate*, November 1995, pp. 42–44.

Kong (1933).[28] Loxton and Prothero argue that sightings of scientifically known species or phenomena take the shape of the dinosaur because of films such as *King Kong* influencing the public imagination. It certainly seems more than plausible that the film played a role in feeding the 1930s mania for the creature. But I would argue that both *King Kong* and Nessie are drawing on the same set of popular narratives of anomalous, prehistoric survival.[29] To borrow a phrase from Bruce Braun, why would a prehistoric survival be a "culturally intelligible" image in the early twentieth century, available to movies like *King Kong* and *The Lost World* and to cultural-scientific texts like the Loch Ness monster narrative?[30] The answers to these questions lie in a long history of "sea serpent" sightings throughout the nineteenth century, a series of stories that would easily adapt to the later Nessie narrative.

Throughout the 1800s, newspapers in the United Kingdom and United States, from the *San Francisco Call* to the *Coventry Evening Telegraph*, reported on sightings of "sea serpents," and these reports were frequent—multiple sightings per year, every year from 1817 onward.[31] While reports of sea serpents were not novel to the nineteenth century, increased ocean travel (particularly due to British imperial practices), increased pressure to classify unknown species, and advances in the field of geology were. The sea serpent sightings of 1817 in Gloucester, Massachusetts in the United States offer an informative starting point, for although these sightings took place in North America and not the United Kingdom, scientists corresponded across the Atlantic regarding the identity of the Gloucester creature, demonstrating the widespread interest in the sea serpent question.[32]

28. Loxton and Prothero, *Abominable Science!* (above n. 1), p. 129.

29. Here, I am indebted to the anonymous reader who pointed out that the film *The Lost World*, produced and first released in the United States in 1925, also features scenes of swimming prehistoric creatures reminiscent of the Nessie-as-plesiosaur image.

30. Bruce Braun, "'On the Raggedy Edge of Risk': Articulations of Race and Nature after Biology," in *Race, Nature, and the Politics of Difference*, ed. Donald S. Moore, Jake Kosek, and Anand Pandian (Durham, NC: Duke University Press, 2003), pp. 175–203, at p. 183.

31. Searching the British Newspaper Archive for the term "sea serpent" shows a cluster of results beginning in 1817, corresponding to the American sightings of that summer, but then a steady stream of articles for approximately the next one hundred years, only markedly decreasing around the beginning of World War I. The year 1860, as a representative example, shows approximately seventy-one articles pertaining to sea serpent sightings from January to the end of May (that includes the same story reprinted in different newspapers).

32. One example of this type of correspondence is *Letters from the Hon. David Humphreys, F. R. S. to the Rt. Hon. Sir Joseph Banks, President of the Royal Society, London; Con-*

Starting in the summer of 1817 (as the century progressed, summer was sometimes referred to as "sea-serpent season") and continuing for several years afterward, locals and tourists alike spotted a giant, unknown creature in the waters of Gloucester's harbors and off the coast.[33] These sightings in particular drew the attention of scientists and the general public because of the composition of the Gloucester community: a majority of the locals were seasoned fishermen and whalers, the conclusion being that if they, too, were perplexed by the creature frolicking in the harbor, then surely it must represent an ocean-dwelling species as yet unknown to science. Or, perhaps, labeled by science as extinct.

The Gloucester sightings were more concentrated, more localized than the sightings that followed in the rest of the nineteenth century. The newspaper-reading public seemed both entertained and weary of the frequency of these sea serpent reports, as the headlines often read "A Sea Serpent," "Another Sea Serpent," "Yet Another Sea Serpent," and so on.[34] Newspapers throughout the United Kingdom

taining Some Account of the Serpent of the Ocean, Frequently Seen in Gloucester Bay (New York: Kirk & Mercein, 1817).

33. For another use of the phrase "sea-serpent season," see "Notes on News," *Burnley Express*, July 23, 1887. This article chronicles a strange green substance falling from the sky in Brooklyn, New York, and then qualifies the story by saying, "This reminds us that the great gooseberry and sea-serpent season is close at hand." By 1887, "sea-serpent season" was then not only literally descriptive of a time of increase in sea serpent stories, but also more generally synonymous with an increase in fantastic or ludicrous stories.

For more on the Gloucester sea serpent, see the first chapter of Sherrie Lynne Lyons, *Species, Serpents, Spirits, and Skulls: Science at the Margins in the Victorian Age* (Albany: SUNY Press, 2009); and Wayne Soini, *Gloucester's Sea Serpent* (Charleston, SC: The History Press, 2010). The Gloucester sea serpent sightings, like those of the Loch Ness monster, are illuminated by the context in which they occurred. In the case of the Gloucester sea serpent, the United States was under pressure at the beginning of the nineteenth century to establish its own scientific community and relevance. This pressure, according to Constantine Rafinesque, a polymath living in the United States, was such that "Whenever a singular phenomenon, or an extraordinary natural occurrence, happens to be observed in the U.S.: whether spots in the Sun, huge fossil bones or sea serpents, a crowd of superficial writers hastens to offer us, instead of facts, their own ideas and conjectures on the subject, which prove, sometimes, more or less ingenius; but often wild, incorrect, or ridiculous" (qtd. in Michael Chandos Brown, "A Natural History of the Gloucester Sea Serpent: Knowledge, Power, and the Culture of Science in Antebellum America," *American Quarterly* 42:3 [1990]: 402–436, at p. 423). In other words, political and cultural pressures may have helped to form the scientific conclusions reached about the Gloucester sea serpent, giving the growing American scientific community a sensational discovery of its own.

34. The following are a few, but by no means the only, examples: "Another Sea-Serpent," *Illustrated London News*, May 3, 1856; "Yet Another Sea-Serpent," *Edinburgh Eve-*

published reports that not only described the creature sighted, but also provided some sort of speculation (either that of the eyewitness or that of the article writer) as to the creature's biological identity. One typical article from 1873, published in the *Edinburgh Evening News*, features the somewhat bored sounding headline "The Sea Serpent Again" and associates the physical description of the creature with "the appearance of the Saurian."[35]

One of the most popular and frequently discussed theories as to the identity of these unknown marine creatures was some sort of prehistoric survival, such as a plesiosaur or a modern relative. Although sightings of sea serpents can be found much further back in history, the nineteenth century saw an increasingly scientific response to the sightings as the growth of paleontology and geology promised potential answers to these marine mysteries. As Sherrie Lynne Lyons writes, "Indeed, it was precisely the developments in science that were responsible for a revival of interest in sea serpents. Increased exploration of the sea combined with paleontological finds suggested that the 'mythical' sea monster might not be a myth after all."[36] As more and more fossils of prehistoric creatures were found, identified, and categorized, the question of whether such animals could still exist was increasingly brought to public attention by both scientists and laypersons.[37]

During the heat of sea serpent speculation in the latter half of the nineteenth century, the dinosaur hypothesis was within the realm of scientific possibility, but toward its outskirts. None other than "Darwin's bulldog" Thomas Huxley wrote to the *Times* in 1893, "there is no a priori reason that I know of why snake bodied reptiles from 50 feet long and upward should not disport themselves in our seas as did those of the Cretaceous epoch which geologically speaking is a mere yesterday."[38] An interpretation such as Huxley's shows how the vast age of the Earth makes long epochs seem relatively short when considering the span of time that complex life forms have inhabited

ning News, September 3, 1878; "The Sea Serpent Again," *Chard and Ilminster News*, October 13, 1894.

35. "The Sea Serpent Again," *Edinburgh Evening News*, November 20, 1873.

36. Lyons, *Species, Serpents, Spirits, and Skulls* (above, n. 33), p. 18.

37. For more on the discovery and classification of fossils in the early nineteenth century, see Martin Rudwick, *Worlds before Adam: The Reconstruction of Geohistory in the Age of Reform* (Chicago: The University of Chicago Press, 2008); and Martin Rudwick, *Earth's Deep History: How It Was Discovered and Why It Matters* (Chicago: The University of Chicago Press, 2014).

38. Qtd. in Lyons, *Species, Serpents, Spirits, and Skulls* (above, n. 33), p. 47.

the planet, which makes the overlapping of humans and Mesozoic creatures seem more likely.

One of the great debates of paleontology and what is now called evolutionary theory in the 1850s and 1860s was the question of how species came to be. Scientists such as Charles Lyell and Huxley adhered, for a time, to the idea of "persistence," that species or species types could survive over millenia, sometimes changing or becoming less populous, sometimes rising in visibility and frequency in the fossil record.[39] Such an idea would allow for the continued survival of animals like the *Plesiosaurus*, but, even in Lyell's day, the pressure to find proof of this phenomenon in the fossil record was high and the evidence itself was hard to come by. Adrian Desmond writes of Huxley's adherence to this idea and its effects: "'Persistence' obviously reinforced the notion of relicts—isolated faunae, often island cast-aways, cut off from mainline evolution. These archaic survivors trapped in the back waters had given rise to the popular notion of living fossils."[40] Some species have indeed been proven to be very closely related to creatures that existed in millennia past, lending some popular credence to this theory.[41] Darwin himself was the one to first use the phrase "living fossil" in his discussion of the platypus and the South American lungfish in the first edition of *On the Origin of Species*: "These anomalous forms may almost be called living fossils; they have endured to the present day, from having inhabited a confined area, and from having thus been exposed to less severe competition."[42]

The modern scientific community has since questioned the integrity and usefulness of the term "living fossils," but the phrase lives on in popular discussions of zoology and thereby seems to represent some sort of useful idea or narrative.[43] Discussions of living fossils,

39. For more on the history of scientific interpretations of the fossil record and the question of species' survival, see Desmond, *Archetypes and Ancestors* (above, n. 9).

40. Desmond, *Archetypes and Ancestors* (above, n. 9), p. 102.

41. The discovery of the coelacanth, a species of fish, in 1938 is a frequently cited example of a "living fossil" and a popular reference in cryptozoological discourse, especially among advocates for the plesiosaur theory. The coelacanth has evolved since the Cretaceous period, but for a long time after its rediscovery, the fish was thought to be basically unchanged for 400 million years. An extended discussion of living fossils and persistence as they were understood near the turn of the century was published in *Knowledge: A Monthly Record of Science* 16 (1893): 55–58, https://books.google.com/books?id=oVFDAQAAMAAJ&dq=knowledge%20a%20monthly%20record%20of%20science%20%22living%20fossil%22&pg=PP9#v=onepage&q=knowledge%20a%20monthly%20record%20of%20science%20%22living%20fossil%22&f=false.

42. Charles Darwin, *On the Origin of Species* (New York: Penguin Classics, 2009), p. 103.

43. A number of scientific studies in the past decade have seriously interrogated the con-

as can be seen from the above passage from *On the Origin of Species*, often include the idea that some sort of geographic or geological isolation allowed for the relic's survival—that a spatial anomaly of some sort created a pocket of asynchronous evolutionary time. Such a story of geological anomaly becomes part of the Nessie-as-plesiosaur narrative. Beginning in the 1930s, some have argued that since, in an earlier geological era, Loch Ness was connected to the open ocean, it may have allowed for individual *Plesiosauri* to enter the lake and stay there until, many millennia later, the lake became closed off from the ocean by the rising land.[44] Other theories suggested that, perhaps, the creature(s) travelled between the ocean and the lake by means of underground tunnels, a theory that has been criticized on the grounds that many searches of the lake's bottom have found no such tunnels.[45] Both of these theories resonate with the narrative of the living fossil, which is often attended by geological anomaly, something unusual about the creature's environment promoting an unusual evolutionary path.

The idea of Loch Ness as being inherently, geologically predisposed to be interestingly anomalous or capable of harboring ancient creatures may have cultural resonances as well as scientific ones. In the Romantic and Victorian periods, English writers frequently depicted the Scottish Highlands as primitive and backward, out of joint with "modern" and civilized England. More specifically, Matthew Wickman argues, "the refractory and inveterately backwards Highlands may be taken to have represented a pre- or anti-modern stage of social and economic development; however, in this normative context of economic probability, the Highlands' reputation for inspiring supernatural and sublime encounters (or extreme instances of witnessing) should be understood as one of their essential rather than incidental features."[46] Wickman focuses on fictional and legal

cept of a "living fossil." One example of such a work is Didier Casane and Patrick Laurenti, "Why Coelacanths Are Not 'Living Fossils,'" *Bioessays* 35:4 (April 2013): 332–338.

44. Recent proponents of this theory include Henry H. Bauer, *The Enigma of Loch Ness* (Eugene: Resource Publications, 1986). Bauer writes, "Many of the present freshwater lochs were then fjords or saltwater lochs. . . . Eventually some of the fjords were cut off from the oceans. The salts in the water became progressively more dilute as the lakes, as they now were, continually received fresh water as rain and run-off from hills and streams, and continually overflowed into the sea. In the end these erstwhile fjords became freshwater lakes" (p. 11).

45. For an example of discussion and refutation of the tunnel theory, see Tony Harmsworth, *Loch Ness Monster Explained & Loch Ness Understood* (Inverness-shire: A. G. Harmsworth, 2010), http://lochnessunderstood.com/introduction.html.

46. Matthew Wickman, "The Allure of the Improbable: Evidence and Romance in the Scottish Highlands, 1746–1790" (PhD diss., UCLA, 2000), p. 4.

discourses to show how the Highlands became figured as the center for the fanciful and the improbable, a combination that provides implicit support for the geological theories marshalled in the Nessie narrative's defense. Although the Loch Ness monster is not one of Wickman's examples, it very well could be; lake monster sightings are often framed as "supernatural encounters" and "extreme instances of witnessing." There are many lake monster legends across the globe and many proposed explanations for these legends, but confluences such as this one, between cultural and geological "anomaly," help to explain the power and fame of the Nessie-as-plesiosaur narrative in particular.

Imaginative Speculation

The potential of "living fossils" brought the emotional significance of dinosaurs and their contemporaries to the public imagination. The plesiosaur as explanation for sea serpents—and, later, for the Loch Ness monster—is one of many examples of speculation about dinosaurs and what it would be or would have been like to be their contemporaries. If dinosaurs had not been wiped out, who would have been master, the giant saurians or man? Would brawn or brains win the day? The possibility of coexistence, however remote, made imaginative reconstructions of prehistoric life take on an even greater emotional import. Scientific discussions of the existence, biology, and habits of dinosaurs and other prehistoric creatures already involved a substantial amount of imaginative work. As early as 1827, Gideon Mantell urged his reader, in *Illustrations of the Geology of Sussex: Containing a General View of the Geological Relations of the South-Eastern Part of England*, to "imagine an animal of the lizard tribe, three or four times as large as the largest crocodile; having jaws, with teeth equal in size to the incisors of the rhinoceros; and crested with horns; such a creature must have been the Iguanodon! Nor were the inhabitants of the waters much less wonderful; witness the Plesiosaurus, which only required wings to be a flying dragon; the fishes resembling Siluri, Balistae, etc. etc."[47] The flora and fauna of the "age of reptiles" are long gone, so writers such as Mantell must exhort their readers to "imagine" the scenes in which they once lived. This imaginative work invites the slippage between the Plesiosaurus and a "flying dragon"—the supernatural becomes a useful register in which to depict dinosaur images and lives. The command to "witness the

47. Gideon Mantell, *Illustrations of the Geology of Sussex: Containing a General View of the Geological Relations of the South-Eastern Part of England* (London: Lupton Relfe, 1827), pp. 83–84.

Plesiosaurus" is emblematic of the qualities shared by the Loch Ness monster narrative and works of Edwardian fiction that I examine here. To "witness the Plesiosaurus," as Mantell directs, is an act of imaginative speculation framed, through the legitimizing word "witness," as part of a normative scientific process.[48] Like this command, the Nessie-as-plesiosaur narrative and certain novels show the inherently unstable boundary between scientific fact and fiction.

The beginning of the twentieth century saw an increase in the publication of texts, both fiction and nonfiction, that explore a hypothetical contest between man and dinosaur. Fiction in particular provided an ideal vehicle for thinking through the "what ifs" of dinosaurs' coexistence with man, including the excitement and fear surrounding the idea of temporal proximity to these creatures. Arthur Conan Doyle's *The Lost World* (1912), for instance, exemplifies the intense attraction and repulsion that the concept of living with dinosaurs presented to the reading public. The novel tells the story of reporter Edward Malone, who commits himself to a voyage to South America with scientist and academic Professor Challenger and a small group of other men in order to confirm Challenger's tales of a land lost to time in which dinosaurs and other anomalies continue to survive. Upon finally arriving atop a massive plateau in South America, the band finds exactly what they were looking for—a place where anomalous geographical isolation has allowed for the survival a primitive hominid species, a diverse collection of dinosaurs, and other prehistoric animals.

The men's excitement at this discovery, however, is tempered by fear and disgust. The dinosaurs threaten the men's lives not, as they first suspect, out of malice, but largely out of stupidity. Malone, for example, at one point flees a predatory dinosaur and falls into a trap set by one of the primitive men: "I took heart, however, as I recalled a conversation between Challenger and Summerlee upon the habits of the great saurians. Both were agreed that the monsters were practically brainless, that there was no room for reason in their tiny cranial cavities, and that if they have disappeared from the rest of the world it was assuredly on account of their own stupidity, which made it impossible for them to adapt themselves to changing conditions."[49]

48. Ralph O'Connor also draws his readers' attention to this particular passage from Mantell's work in *The Earth on Show (above, n. 8)*. O'Connor argues that the transition from "imagine" in the passage's first sentence to "witness" represents part of an intensification of "visual rhetoric" (p. 127). I would emphasize here that, in my reading of Mantell, "imagining" and "witnessing" are not categorically opposed actions, but instead crucially related scientific processes.

49. Sir Arthur Conan Doyle, *The Lost World* (London: Penguin Classics, 2007), p. 119.

This idea that connected the mass extinction of the dinosaurs with their intelligence had wide currency at the time that Doyle published *The Lost World* in 1912 (and for several decades before). H. N. Hutchinson's *Extinct Monsters: A Popular Account of Some of the Larger Forms of Ancient Animal Life* (1893) discusses the Brontosaurus, for instance, thus: "It was nearly sixty feet long, and probably when alive weighed more than twenty tons! That it was a stupid, slow-moving reptile, may be inferred from its very small brain and slender spinal cord."[50] Paleontologists and other scientists used fossilized dinosaur skulls and made casts of the cranial space in order to get a sense for what the animals' brains were like and drew conclusions about the animals' intelligence from these casts. American paleontologist O. C. Marsh was one of the originators and proponents of the "stupid dinosaur" theory, even naming a species of dinosaur *Morosaurus*, which translates to "moron" or "stupid" lizard.[51] W. J. T. Mitchell, in his cultural history of the dinosaur, calls this image of saurian intelligence the "'classic' model of the dinosaur—the slow, stupid giant that is incapable of adapting to any sort of change."[52] By emphasizing saurian stupidity, in both scientific and fictional texts, writers not only engaged in what was perceived as scientific progress and knowledge production, but also reasserted man's dominance in a time when humanity's proximity to dinosaur life felt threatening. Both the Nessie-as-plesiosaur narrative and fictions of the "stupid dinosaur" were ways of thinking through the possibility of dinosaur survival.

Doyle's fictional world allows for a laboratory-like experimentation with evolution. "On the one hand, we find the homely idea of the 'great lizards' as anachronistic beasts who naturally had to give way to more flexible species, but on the other hand, in Doyle's prehistoric setting the competition of species has not yet been decided in favor of modern man."[53] The preservation of dinosaurs on the plateau brings modern man and ancient reptile into direct competition for the first time, and the former is initially filled with terror at the size and power of the latter. However, the novel's specific setting

50. H. N. Hutchinson, *Extinct Monsters: A Popular Account of Some of the Larger Forms of Ancient Animal Life* (London: Chapman & Hall, Ltd., 1893), p. 64.

51. Richard Conniff, *House of Lost Worlds: Dinosaurs, Dynasties, and the Story of Life on Earth* (New Haven, CT: Yale University Press), p. 268.

52. W. J. T. Mitchell, *The Last Dinosaur Book: The Life and Times of a Cultural Icon* (Chicago: The University of Chicago Press, 1998), p. 28.

53. Stefan Lampadius, "Evolutionary Ideas in Arthur Conan Doyle's *The Lost World*," in *Inklings: Jahrbuch für Literatur und Ästhetik 29: Der Andere Conan Doyle*, ed. Dieter Petzold (Frankfurt: Peter Lang, 2012), pp. 68–97, at p. 78.

reminds us that these dinosaurs survived as the result of geographic anomaly, and the modern humans' interactions with the dinosaurs promote the narrative that the reptiles may be too "stupid" and unable to survive in the wider world.

The kind of speculative science texts such as Doyle's engage in is little different from the kind of speculative science that early on spawned the connections between sea serpents and ancient plesiosaurs. However, there are certain differences arising from genre that affect the tone of their respective narratives. Reports of "real" serpent sightings were affected by the quality of distance, in two senses of the word. First, sightings were often literally from far away, either spectators on a boat or on shore watching something in the water. Second, many only experienced these sightings secondhand, through reading the report in a newspaper or in a book. This distance and the lack of an embodied personal experience may explain the matter-of-fact and sometimes slightly humorous tone of the newspaper articles. Works of fiction, on the other hand, offer a different experience of the narrative. Certain novels in the adventure, science fiction, and Gothic genres gain their sense of excitement and horror from the evaporation of that distance. Not only is the temporal distance between humans and dinosaurs taken away, but so is the literal, physical distance. Characters in texts by Doyle and Bram Stoker, for example, feel their very lives threatened by encounters with the prehistoric.

However, one key difference between these fictional texts is whether they figure the saurian survival narrative as a question of natural or supernatural relevance. In some novels, such as Doyle's *The Lost World*, the dinosaur is a "natural" animal. In that text, the dinosaur provides danger to the plot, but it is a clearly scientifically knowable danger. The survival of dinosaurs and other prehistoric creatures is considered highly unlikely (Challenger is mocked by the scientific community for his stories), but ultimately within the realm of scientific possibility. In other narratives, however, the positing of a "natural" animal such as a dinosaur outside of its "natural" time frame creates a supernatural space for the creature, often inviting other supernatural characteristics not normally attributed to dinosaurs. This association with the supernatural occurs in the Nessie narrative—stories of the creature's supposed history get anthologized in collections of "supernatural lore" and published in venues like *Supernatural Magazine*—as well as in novels such as Bram Stoker's *The Lair of the White Worm* (1911). The plot of Stoker's novel features the Lady Arabella, a seemingly beautiful young woman, but who, in reality, harbors the spirit of an ancient and evil "white worm" or

dragon inside her. The men who discover Arabella's dual identity, Adan Salton and Sir Nathaniel de Salis, finally succeed in killing Arabella and putting the ancient monster to rest using a modern invention: dynamite.

Stoker criticism has long identified his use of Gothic plots and tropes as a way of expressing anxieties about a number of social issues of his time: foreignness, degenerating masculinity, homosexuality, femininity, and "the New Woman," among others. However, Stoker's abiding interest in the processes and products of science was not fully explored until 2002, when Carol Senf published her *Science and Social Science in Bram Stoker's Fiction*.[54] Senf helped to establish the terms of the debate regarding Stoker's fiction's engagement with scientific discourse, and much of the more recent scholarship on the subject continues to respond to Senf's work in some way.[55] Key to Senf's argument is the concept that the Gothic and the scientific are two coherent, mutually exclusive forces.

Like J. D. Ballam in his work on Stoker's *The Jewel of the Seven Stars* and *The Lair of the White Worm*, I find it more useful (and more accurate) to see how Stoker's fiction fuses the Gothic and the scientific rather than how it opposes them. Like the Nessie narrative, *The Lair of the White Worm* uses imaginative speculation and scientific knowledge to compose a story. Ballam argues that Stoker's perspective is that science "is useful insofar as it provides the 'base of wonders.'"[56] In other words, science provides the necessary framework for articulating its own limits; characters use scientific rationality until it fails them, thereby indicating the bounds of the occult, what is unexplainable by science. For Ballam, this function performed by science is also one of its flaws:

> for Stoker the empirical nature of scientific enquiry limits its potential for success insofar as it limits both the purposes of such investigations—encouraging us to know what, when our emphasis might be on why—while at the same

54. Carol Senf, *Science and Social Science in Bram Stoker's Fiction* (Westport, CT: Greenwood Press, 2002).

55. For more on Stoker's engagement with science, see Glennis Byron, "Bram Stoker's Gothic and the Resources of Science," *Critical Survey* 19:2 (2007): 48–62; John Greenway, "Seward's Folly: *Dracula* as Critique of Normal Science," *Stanford Literature Review* 3:2 (1986): 213–230; and Diane Long Hoeveler, "Objectifying Anxieties: Scientific Ideologies in Bram Stoker's *Dracula* and *The Lair of the White Worm*," *Romanticism on the Net* 44 (2006): https://www.erudit.org/en/journals/ron/2006-n44-ron1433/014003ar/.

56. J. D. Ballam, "'Science as the Base of Wonders': Rational Enquiry in Bram Stoker's *The Jewel of Seven Stars* and *The Lair of the White Worm*," in *Restoring the Mystery of the Rainbow: Literature's Refraction of Science*, ed. Valeria Tinkler-Villani and C. C. Barfoot (New York: Rodopi, 2011), pp. 151–166, at p. 157.

> time denying the scientist the means to investigate matters with either the tools or the frame of reference for which his commonplace rational enquiry can offer no understanding.[57]

Science, according to Ballam's reading of Stoker, is flawed precisely for its claims of universality; other modes of investigation must be employed to approach issues outside the realm of "commonplace rational enquiry."

In a novel such as *The Lair of the White Worm*, I believe that Senf's and even a more complex reading such as Ballam's both discount the degree to which the so-called Gothic threat is always already constructed out of scientific knowledge. Thus, in my reading of Stoker's novel, science is not a monolithic category, but a constant process of renegotiating the boundary between the natural and supernatural. In invoking the terms "natural" and "supernatural" and how they help to articulate the bounds of scientific discourse, I find Srdjan Smajic's work on supernatural realism particularly helpful. In his examination of the role of seemingly supernatural events in what are often classified as typically realist Victorian novels, Smajic presents the literary supernatural in a simple and clear way: "The marvelous in fiction occurs when the known laws of nature have clearly been violated and must therefore be reconceptualized."[58] For Smajic, this version of the supernatural is not opposed to literary realism, but has a logical and even necessary place in the realism of the nineteenth century. *Jane Eyre*, and specifically the scene in which Jane seems to hear Rochester's voice telepathically, serves as an ideal example of this supernatural realism: "The 'specter' of superstition is laid to rest instantly, and what does the job is not Jane's incredulous attitude toward superstition but her unwavering faith in the extraordinary range of natural phenomena. At 'her best' nature is not miraculous but wondrously manifold and inexhaustible. What are called laws of nature, Bronte suggests, are at best working hypotheses, at worst premature conclusions based on insufficient evidence and limited experience."[59] Science always studies "natural phenomena," but sometimes, those phenomena may appear to exceed the currently understood bounds of the natural.

Since the very rules of the natural world are what is at stake, then a novel such as *The Lair of the White Worm* is not offering science as a force of salvation so much as depicting the messy, imaginative, and

57. Ballam, "'Science as the Base of Wonders'" (above, n. 56), p. 166.

58. Srdjan Smajic, "Supernatural Realism," *NOVEL* 42:1 (2009):1–22, at p. 3.

59. Ibid., p. 15.

uneven process of scientific understanding itself. Like the Nessie-as-plesiosaur narrative, the novel's "white worm" encourages the reader to consider the supernatural and the act of imaginative speculation as, ultimately, scientific. From the beginning of the text, discussions of the white worm's origins and identity skirt an apparent boundary between natural and supernatural. Adam and Sir Nathaniel debate how the legendary "worm" was a "monster of vast size and power—a veritable dragon or serpent, such as legend attributes to vast fens or quags where there was illimitable room for expansion."[60] Visible, in this beginning of a much longer passage, is how the language of myth ("monster," "dragon," "legend") blends with the language of science (how space has created the opportunity for massive growth). Nathaniel continues:

> A glance at a geological map will show that whatever truth there may have been of the actuality of such monsters in the early geologic periods, at least there was plenty of possibility. In England there were originally vast plains where the plentiful supply of water could gather. The streams were deep and slow, and there were holes of abysmal depth, where any kind and size of ante-diluvian monster could find a habitat. . . . Who can tell us when the age of the monsters which flourished in slime came to an end? There must have been places and conditions which made for greater longevity, greater size, greater strength than was usual. Such over-lappings may have come down even to our earlier centuries.[61]

Even though the men are discussing a little-understood, possibly supernatural monster, in the above description, they make use of scientific knowledge, diction, and reasoning to explain its existence. The ancient prehistory of England's geology provides the physical opportunity for the life and growth of certain species, species that in turn become shaped by that environment.

Imagining an Earth that is almost inconceivably ancient and extrapolating from current geological processes to depict what must have occurred in the Earth's ancient past are both speculative acts, yet are part of a conventional scientific framework by the time "Lair" was written. The passage referred to in the previous paragraph illustrates this, and there are many other moments in the text in which characters use this combination of geologic knowledge and imaginative speculation (such as De Salis's rhetorical question, "Who can

60. Bram Stoker, *The Lair of the White Worm*, in *Dracula's Guest and Other Weird Stories* (London: Penguin Classics, 2006), p. 187.

61. Ibid.

tell . . . ?") to establish the geological and biological unknowns posed by Arabella. Nathaniel concludes the exchange by saying, "That such a time existed, we have evidences in geology, but there only; we can never expect proofs such as this age demands. We can only imagine or surmise such things—or such conditions and such forces as overcame them."[62] As scientific as the discussion of the white worm is, it also simultaneously articulates what spills out of or seems to exceed scientific discourse. Even the labels Salton and De Salis give Arabella indicate the slippage between science as empirical salvation and science as gateway to the supernatural: she is both a "dragon" and a "diplodocus." The language of geology both offers a scientific narrative for the monster and also points out the ways in which that narrative currently exceeds the bounds of scientific empiricism and understandings of "natural" laws.

The use of both natural and supernatural discourses, as seen in Stoker's novel and the Loch Ness monster narrative, helps to capture the ambiguous scientific space that such creatures inhabit, both in fiction and in the historical nineteenth and early twentieth centuries. The sciences of geology and paleontology can explain the existence of a giant creature like the white worm, but their explanatory power is not strong enough to narrate the precise origins of the worm's abilities or specific evolutionary path. For Stoker's characters, supernatural rhetoric of the "dragon" helps to bridge the gap between known science and a still-perplexing reality. The theory of the Loch Ness monster as plesiosaur descendant also provides a focal point for a moment when changing understanding of natural laws makes the pure opposition of natural and supernatural impossible.

In December of 1933, the *Dundee Courier and Advertiser* published an article entitled "The Loch Ness Monster in Parliament." After the weight of evidence and sightings of the preceding year, the Secretary of Scotland was being pressured to begin a scientific inquiry into the existence of the creature and, simultaneously, a legal effort to protect it. This event, according to the writer, represented a significant victory for the serpent, "for to become a Parliamentary subject is to become real."[63] The question of what is scientifically "real" haunts these stories of prehistoric survival, both in accounts of aquatic serpents and works of fiction. Periods of time in which what is "natural" is as yet unclear are also moments in which what is the realm of science and what is the realm of quacks and magic is unclear, too.

62. Ibid., p. 189.

63. "The Loch Ness Monster in Parliament," *Dundee Courier*, December 11, 1933.

The narrative of the serpent-as-plesiosaur, trapped out of time by geological fate and strange chance, can be found in many novels, films, and cryptozoological accounts. There have been stories of a creature or creatures in Loch Ness for a long time, but it is only after science offers up the plesiosaur shape that sightings begin to gain the long neck, small head, and flippers of the saurian legend.